REMARKS

Claim 52 has been canceled. Claims 46-51 and 53-115 and new Claims 116 and 117 are active in the case.

The present invention relates to a catalyst composition that promotes the conversion of aliphatic hydrocarbons of 3 to 6 carbon atoms to hydrocarbon aromatic compounds.

Claim Amendments

Claims 46 and 71 have been amended to recite that the zeolite component of the catalyst is comprised of crystallites, at least 90 % of which have diameters smaller than 500 Å. This amendment finds support in canceled Claim 52. Other minor clarifying amendments have been made to a number of claims in order to improve upon the language of the claims. None of the amendments raise an issue of new matter.

New claims 116 and 117 have been added, basis for which can be found in Claims 46 and 97 and pages 13-16 of the text. Entry of amendments into the record is respectfully requested.

Invention

The present invention is directed to a process for the production of aromatic hydrocarbon compounds which comprises contacting one or more aliphatic hydrocarbons containing from 3 to 6 carbon atoms with a catalytic composition comprising (i) gallium, (ii) at least one lanthanide element, and (iii) a zeolite belonging to the MFI, MEL or MFI/MEL families, the crystal lattice of which is made-up of silicon oxide and at least one metal oxide selected from the group consisting of aluminum oxide, boron oxide and gallium oxide and is

comprised of crystallites, at least 90 % of which have diameters smaller than 500 Å.

Applicants maintain that one of skill in the art would not be motivated to combine the prior art disclosures of record in the parent application and find a suggestion of the present invention, because, even though the synthesis of aromatic hydrocarbons from other hydrocarbons is taught, Harandi teaches a catalyst system for an integrated process in which iso-olefins and methanol are combined to produce methyl tert-alkyl ethers while olefins and perhaps some paraffins are simultaneously converted to aromatic hydrocarbons and Burress teaches the processing of a feedstock containing one or more of ethylene, propylene and propane to an aromatic material (the examples show the conversion of a refinery off gas that is comprised of one-third olefins) to aromatic hydrocarbon material. These feedstocks are **not** employed in the present invention nor by Diaz. Diaz discloses the processing of hydrocarbon feedstock of open chain hydrocarbons to aromatic hydrocarbon material as does the present invention. However, it is clear that in view of the material differences in feedstock materials that are processed in the disclosures of the references, that one of skill would not be motivated to substitute a particular catalyst of one reference into the process of another with the expectation of achieving the same or superior conversion results. In other words, the different processes of the references employing different feedstocks precludes a proper combination of teachings of these references.

The Diaz patent is the most relevant of the cited documentation because it discloses a process of aromatizing a feedstock mixture of C_2-C_4-aliphatic hydrocarbons in the presence of a zeolite material that has been impregnated with gallium and at least one lanthanide such as misch metal. However, there is no teaching or suggestion in the patent of the specific metal containing zeolite of the present invention which is specified as having crystallites, at

least 90 % of which have diameters less than 500 Å. The criticality of this limitation to the description of the present invention in the claims is demonstrated in Examples 20-29 of the text and Figures 1-5. Briefly, Figs. 3 and 4 of the application show the wt %s of the BTEX obtained with respect to the total amounts of effluent material from aliphatic hydrocarbon conversion processes of Examples 25 and 26, which describe zeolite catalysts within the scope of the invention, and of Example 28, which utilizes the conventional zeolite based catalyst as described in Example 24. Figs 3 and 4 show the superior long term consistent production of BTEX with catalyst embodiments of the present invention versus the BTEX production obtained with the comparative zeolite catalyst of Example 24. Clearly, Diaz does not show or suggest the invention as claimed.

The deficiencies of the Diaz patent are neither overcome nor improved upon by the disclosure of Harandi which discloses a process of aromatizing a feedstock material which is comprised of C_2-C_4-paraffins and/or olefins in the presence of a zeolite catalyst which may contain Ga, if the metal is selected from the group of Zn, Cu, Ga and Pt. Accordingly, not only does the patent not describe or suggest a zeolite catalyst containing both Ga and at least one lanthanide, it also does not show or suggest a zeolite catalyst of any sort that meets the crystallite limitation of the present claims. Thus, Harandi does not overcome or improve upon the deficiencies of Diaz.

The deficiencies of the Diaz patent are neither overcome nor improved upon by the disclosure of Burress which discloses a process of aromatizing a feedstock material which is comprised of C_2-C_4-paraffins and/or olefins in the presence of a zeolite catalyst which contains both Ga and thorium. The zeolite catalyst is described as possibly being of the ZSM-5 type of a microcrystalline size of 0.02 to 0.05 microns. However, there is no teaching or

suggestion of a zeolite catalyst that contains both gallium and at least one lanthanide earth element, and certainly no teaching or suggestion of a zeolite that is characterized by a crystallite structure in which at least 90 % of the crystallites have diameters less than 500 Å. Accordingly, Burress does not improve upon or overcome the deficiencies of Diaz and withdrawal of the prior art ground of rejection is respectfully requested.

It is now believed that the application is in proper condition for consideration for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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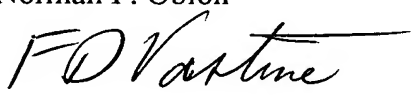

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